

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 7-14, and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang (US 2003/0189748 A1).

Regarding claims 1 and 10, Wang teaches a non-liquid crystal light valve, which is optically coupled to a projection lens (310, figure 3A); a light recycling device, which reflects at least a portion of the light that is reflected by the light-valve along a light path of the system, and to an imaging surface increasing the brightness of an image (320,330, 360, figure 3B).

Regarding claims 2 and 11, Wang further teaches the light-valve is a digital micro-mirror device (paragraph 0026).

Regarding claims 3 and 12, Wang further teaches the DMD includes a plurality of reflective elements each having a respective axis about which the elements rotate (axis into the page, figure 3A-C), and the DMD is oriented so that light incident from the system is in a plane that is perpendicular to a plane of the axes (plane of the page,

Art Unit: 2851

figures 3A-C). The light is traveling along the plane of the page which is perpendicular to the axis into the page.

Regarding claims 4 and 13, Wang further teaches the light recycling device includes a waveguide (330, figure 3B).

Regarding claims 5 and 14, Wang further teaches the waveguide has a reflective surface and an aperture on one end thereof (3321, 3322, figure 3D).

Regarding claims 7, and 16, Wang further teaches at least one prism, which reflects light from the DMD back to the system (360, figure 3B).

Regarding claims 8 and 17, Wang further teaches a projection lens offset relative to the DMD (370, figure 3A). The lens elements 370 are offset spatially from the modulator 310 by at least the width of the prism element 360.

Regarding claims 9 and 18, Wang further teaches the DMD is tilted relative to a projection lens (310, figure 3C).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Huibers (US 2003/0218726 A1).

Regarding claims 6 and 15, Wang teaches a color filter disposed between the waveguide and the projection lens (340, figure 3A). Wang does not specify that the color filter is a sequential color wheel. Huibers teaches a color wheel between the waveguide and the projection lens (10, figure 1). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to replace the color filter of Wang with the color wheel of Huibers in order to provide sequential colors to the modulator resulting in a full color image.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Naito (US Patent 6,710,909 B2) is a light recycling system for recycling off state light at the modulator wherein the projector lens is angularly offset from the modulator.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN HOWARD whose telephone number is (571)270-5358. The examiner can normally be reached on Monday-Friday 7:30-5:00, First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571)272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2851

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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